

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method for modeling a system design comprising the steps of:

defining at least one cell that ~~describes~~ identifies a collection of elements constituting a device ~~within the system~~;

defining one or more instances of said at least one cell within the system using a folded circuit model, ~~wherein the instances describe devices that are used to form the functionality of the cell~~; and

defining occurrence nodes for each of said one or more instances, wherein said occurrence nodes are arranged in one or more hierarchical levels; and associating the occurrence nodes with the one or more instances.

2. (Original) The method of claim 1 wherein each occurrence node comprises specific occurrence data for that occurrence node.

3. (Currently Amended) The method of claim 1 wherein each occurrence node comprises owner pointer information that indicates a specific occurrence node in a previous level.

4. (Currently Amended) The method of claim 3 wherein said owner pointer information operates as a search key that allows $O(\log N)$ search performance.

5. (Currently Amended) The method of claim 3 further comprising:
searching said occurrence nodes using said owner pointer information.

6. (Original) The method of claim 3 wherein said pointer information for a top level occurrence node is a null pointer.

7. (Currently Amended) The method of claim 1 wherein each occurrence node comprises describer pointer information that points to information in said folded model that is common to a plurality of the occurrence nodes.

8. (Currently Amended) The method of claim 1 further comprising the steps of:
defining occurrence specific data for each occurrence node;
defining an owner pointer for each occurrence node, wherein the owner pointer indicates a specific occurrence node in a previous level; and
defining a describer pointer for each occurrence node, wherein said describer pointer points to an instance that is used to describe the occurrence node.
9. (Currently Amended) The method of claim 1 further comprising the step of:
defining net occurrences for each of said occurrence nodes; and
defining describer pointers for each net occurrence node, wherein said describer pointer points to a net that is used to described the occurrence node.
10. (Original) The method of claim 1 wherein users define a portion of the system by defining a number of cells, instances and occurrence nodes that are less than the total number of cells, instances and occurrence nodes.
11. (Currently Amended) A method for defining and analyzing a system that is defined by a folded model comprising cells and instances, the method comprising the steps of:
defining occurrence nodes ~~for said folded model, wherein said occurrence nodes are arranged in hierarchical levels, wherein each occurrence node identifies a corresponding instance in said folded model;~~ and
specifying a pointer for each of said occurrence nodes, wherein the pointer points to a specific occurrence node in another level.
12. (Original) The method of claim 11 further comprising:
assigning a top level occurrence node a null pointer to indicate it is the top level node.
13. (Original) The method of claim 11 wherein said pointer allows users to search both up and down the hierarchical levels with a $O(\log N)$ performance.
14. (Original) The method of claim 13 further comprising the step of:
searching said occurrence nodes using the pointer as a search key.
15. (Original) The method of claim 14 wherein the searching step further comprises:
searching with a map container of a Standard Template Library.

16. (Currently Amended) A method for providing occurrence nodes for a ~~lightweight folded circuit~~ model comprising the steps of:

specifying data that is specific to each of said occurrence nodes;
specifying owner pointers for each of said occurrence nodes, wherein said owner pointers point to a occurrence node in a different level in a hierarchy of levels; and
specifying describer pointers for each of said occurrence nodes, wherein said describer pointers point to ~~information that is common to a plurality of occurrence nodes~~ instances of a folded circuit model that are associated with cells that define circuit elements of said occurrence nodes.

17. (Original) The method of claim 16 further comprising:
specifying only a portion of the total number of occurrence nodes that are required to define an entire system.

18. (Original) The method of claim 17 wherein the specified portion of occurrence nodes are those occurrence nodes that are required to analyze a selected part of the system.

19. (Currently Amended) The method of claim 16 further comprising the step of:
storing the specified data and pointers in the folded circuit model.

20. (Original) The method of claim 16 wherein said owner pointer can be searched to identify specific occurrence nodes both up and down in the hierarchy of levels.

21. (New) A method for designing a circuit, comprising:
defining a folded model of said circuit, wherein said folded model represents said circuit as a linked structure of cells and instances of the cells, wherein each cell defines a respective collection of elements constituting a device and the linked structure is constructed such that each instance of the same cell points to the same cell; and
defining occurrence nodes to provide data members for storing circuit information unique to the corresponding instances of the folded model, wherein each occurrence node identifies a corresponding instance of said folded model and identifies an owner occurrence node in a previous hierarchical level.

22. (New) The method of claim 21 wherein an occurrence node located at a highest level of said circuit includes a NULL value for an identification of its owner occurrence node.

23. (New) The method of claim 21 wherein said occurrence nodes do not store information identifying collections of elements associated with the devices of said occurrence nodes.

24. (New) The method of claim 21 wherein said occurrence nodes do not store information identifying child nodes within said occurrence model.

25. (New) The method of claim 21 wherein said occurrence nodes do not store naming information that uniquely identifies said occurrence nodes.

26. (New) The method of claim 25 further comprising:
constructing a unique identifier for a selected occurrence node by traversing hierarchical levels of said occurrence nodes using identifications of owner occurrence nodes.

27. (New) The method of claim 21 further comprising:
conducting a search for a selected occurrence node by using an identifier of the selected occurrence node's owner as a search key.